

SC-80MR

METAL CORED ARC WELDING CONSUMABLE
FOR 550MPa CLASS HIGH TENSILE STEEL

2020.12



❖ Specification

<i>AWS A5.28</i>	E80C-G
<i>(AWS A5.28M)</i>	E55C-G)
<i>EN ISO 17632-A</i>	T50 6 1.5Ni M M21 2 H5

❖ Applications

SC-80MR is used for welding in offshore structure and heavy equipment and general structural fabrication

❖ Characteristics on Usage

SC-80MR is a metal cored wire designed for single-side welding and is also suitable for multi-pass welding in thick plate. SC-80MR provides an exceptionally smooth and stable arc, low spatter and minimal slag coverage and achieves good impact value to low temperature(-62℃).

❖ Note on Usage

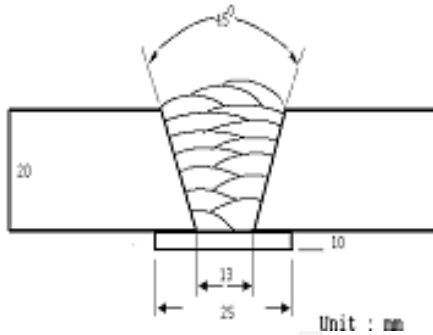
1. Proper preheating(50~150℃) and interpass temperature must be used in order to release hydrogen which may cause cracking in weld metal when electrodes are used for medium and heavy plates
2. Use Ar + 20-25% CO₂ gas.



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

- Welding Position** : 1G(PA)
- Diameter** : 1.2mm (0.045in)
- Shielding Gas** : 80%Ar + 20%CO₂
- Flow Rate** : 20 ℓ /min
- Amp./ Volt.** : 280A/ 30V
- Stick-Out** : 20~25mm (0.79~0.98in)
- Pre-Heat** : R.T .
- Interpass Temp.** : 150±15℃ (302±59°F)
- Polarity** : DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL (%)	-60℃ (-76°F)
SC-80MR	612 (89,000)	658 (95,000)	25.5	88 (65)
AWS A5.18 E80C-G	-	≥ 550 (80,000)	-	-

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
SC-80MR	0.072	0.35	1.55	0.014	0.007	1.55
AWS A5.18 E80C-G	N/S (Not Specified) ^h					

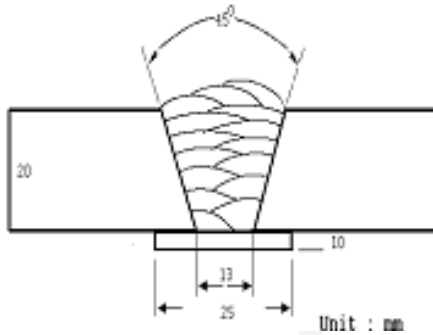
* h : The electrode must have a minimum of one or more of the following: ≥0.5%Ni, ≥0.3%Cr, ≥0.2%Mo



Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Welding Position	: 1G(PA)
Diameter	: 1.4mm (0.052in)
Shielding Gas	: 80%Ar + 20%CO ₂
Flow Rate	: 20 ℓ /min
Amp./ Volt.	: 300 A/ 30V
Stick-Out	: 20~25mm (0.79~0.98in)
Pre-Heat	: R.T.
Interpass Temp.	: 150±15°C (302±59°F)
Polarity	: DC(+)

❖ Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Impact Test J(ft · lbs)
	YS MPa (lbs/in ²)	TS MPa (lbs/in ²)	EL (%)	-60°C (-76°F)
SC-80MR	608 (88,000)	652 (95,000)	25.0	81 (60)
AWS A5.18 E80C-G	-	≥ 550 (80,000)	-	-

❖ Chemical Analysis of all weld metal(wt%)

Consumable	C	Si	Mn	P	S	Ni
SC-80MR	0.070	0.32	1.54	0.013	0.008	1.57
AWS A5.18 E80C-G	N/S (Not Specified) ^h					

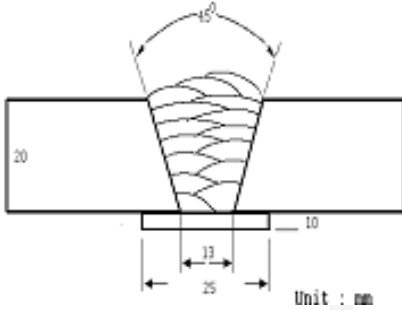
* h : The electrode must have a minimum of one or more of the following: ≥0.5%Ni, ≥0.3%Cr, ≥0.2%Mo



Impact Toughness Test on Various Temp.

❖ Welding Conditions

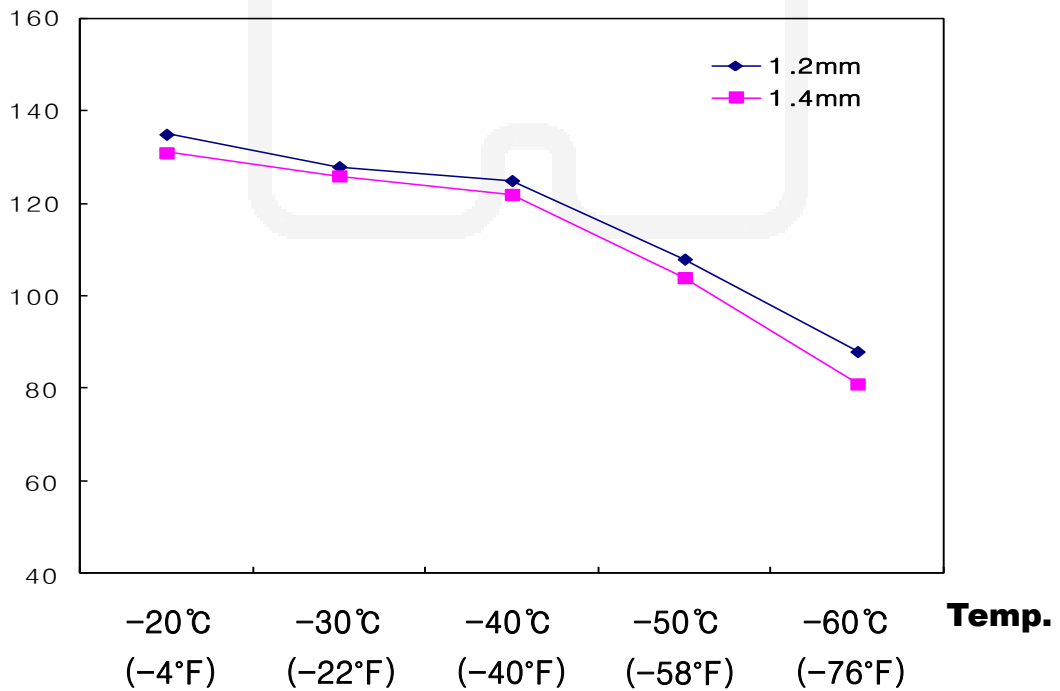
Method by AWS Spec.



Diameter	:	1.2mm (0.045in)	1.4mm (0.052in)
Shielding Gas	:	80%Ar + 20%CO ₂	
Flow Rate	:	20 l /min	
Amps / Volts	:	280A / 30V	300A / 30V
Stick-Out	:	20~25mm (0.79~0.98in)	
Pre-Heat(°C)	:	Room Temp.	
Inter-Pass Temp.	:	150±15°C (302±59°F)	
Current Type & Polarity	:	DC(+)	

[Joint Preparation & Layer Details]

Joule





Diffusible Hydrogen Content

❖ Welding Conditions

Diameter	: 1.4mm (0.052in)	Amps / Volts	: 300A / 30V
Shielding Gas	: 80%Ar +20%CO ₂	Stick-Out(mm)	: 20~25mm (0.79~0.98in)
Flow Rate	: 20 ℓ /min	Welding Speed	: 30 cm/min (12 in/min)
Welding Position	: 1G (PA)	Current Type & Polarity	: DC(+)

❖ Hydrogen Analysis Using Gas Chromatography Method

Hydrogen Evolution Time	: 72 hrs
Evolution Temp.	: 45 °C (113°F)
Barometric Pressure	: 780 mm-Hg

❖ Result(*ml*/100g Weld Metal)

X1	X2	X3	X4
3.8	3.9	3.7	3.5

Average Hydrogen Content **3.7 ml / 100g Weld Metal**



Welding Efficiency

❖ Deposition Rate & Efficiency

Consumable	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
	Amp.(A)	Volt.(V)			
SC-80MR 1.2mm (0.045in)	180	23	6.1(240)	92~94	2.12(4.7)
	240	26	8.9(350)	93~95	3.76(8.3)
	280	30	11.0(430)	95~97	4.65(10.2)
Remark				Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60

* Shielding Gas : 80%Ar+20%CO₂



Proper Welding Condition

❖ Welding Conditions

Consumable	Shielding Gas	Welding Position	Amp.(A) / Volt.(V)	
			1.2mm (0.045in)	1.4mm (0.052in)
SC-80MR	80%Ar +20%CO ₂	F & HF	200~300Amp	220~350Amp
		V-Up & OH	120~220Amp	140~240Amp
		V-Down	200~300Amp	220~300Amp

❖ F No & A No

F No	A No
6	10